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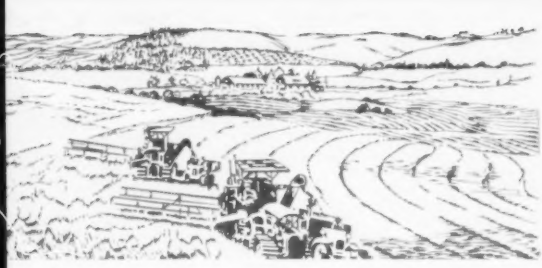

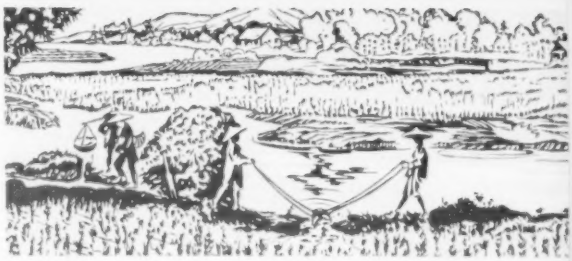

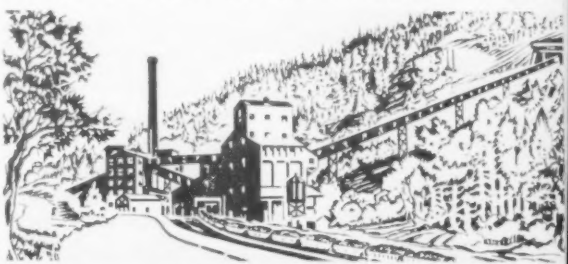

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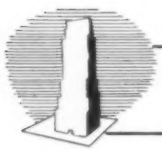

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Dr. Warman is Professor of Geography and Secretary, Graduate School of Geography, Clark University. He has written numerous articles and books. His last article which appeared in the JOURNAL OF GEOGRAPHY was published in January, 1957 and is entitled "Improving the College Training of Geography Majors." He will read a paper at the forty-third annual meeting of the National Council for Geographic Education in St. Louis entitled "Changing Emphases in Geographic Education."

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Mr. Jackson has a Bachelor's and Master's degree from New York University. After teaching seven years at Texas Southern University, he went to Morgan State College, Maryland. He is now in the New York City Public Schools.

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Dr. Heimonen is an Associate Professor in the Department of Geography and Earth Science at Northern Michigan College in Marquette, Michigan. His interest in aerial photo interpretation stems from four years of World War II service as an aerial photo intelligence officer with the U. S. Navy.

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VOLUME LVI SEPTEMBER 1957 NUMBER 6

HOW TO MAKE A RELIEF MODEL QUICKLY[1]

HENRY J. WARMAN
Clark University, Worcester, Massachusetts

A problem ever present with geography teachers is that of making a flat map such as the United States standard topographic map assume third dimensional aspects in the eyes and minds of the students. The construction of a plaster topographic model is time-consuming; and the use of the new plastic relief topographic maps denies the students the privilege and experience of making a model. In the first case only a few students actually are engaged in making such a model. In the second case enough plastic models, due to their cost, are not available for every student in the class.

Here are some suggestions which, if followed, will bring an entire class into the project. The materials are few, cheap and easy to obtain. They consist of: one plywood sheet 12″ × 15″ × ¼″, "X" pieces of ½″ × 10″ pine, ¾″ lg. brads, tack hammer, rubber cement, 1/16″ (minimum) thickness cardboard, a 12″ rule, scissors, graph paper (10 squares to the inch) and pencils.

Most textbooks at the secondary and college levels contain a sample topographic map. The end papers of the textbook used in this exercise were parts of topographic maps.[2] Each student is assigned a cross section (see Figure 1). The number of students in a class represents the number of cross sections to be drawn. The spacing of the sections is also determined by the number of students. Assignment of the numbered cross-sections may be made alphabetically. The teacher then should issue pieces of graph paper on which a base line is drawn. The selected base line must be below the lowest elevation shown on the topographic map.

[1] Three members of a Freshman class, two from Ethiopia, Mekbib Mammo and Taye Reta, volunteered to assemble the relief model. Stanley Pacek, the third volunteer, thought it a good idea to use his photography hobby, hence this illustrated article.

[2] The textbook used was "Introduction to Geography" by Kendall, Glendinning and MacFadden.

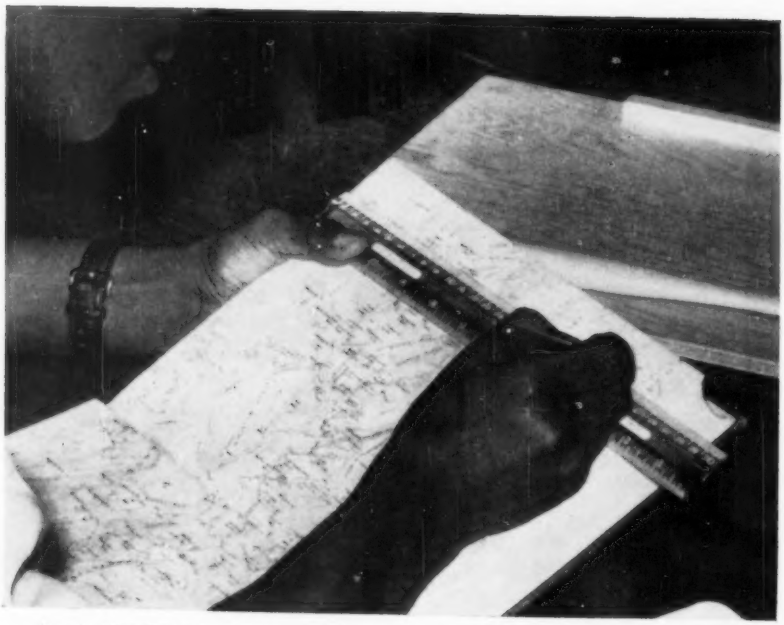

FIG. 1. The first step in the model construction of this vertical exaggeration begins with the student being assigned a specific lateral section on the map. Here, Mr. Mammo draws a pencil line to identify his assignment on a section of the contour map of Glacier National Park.

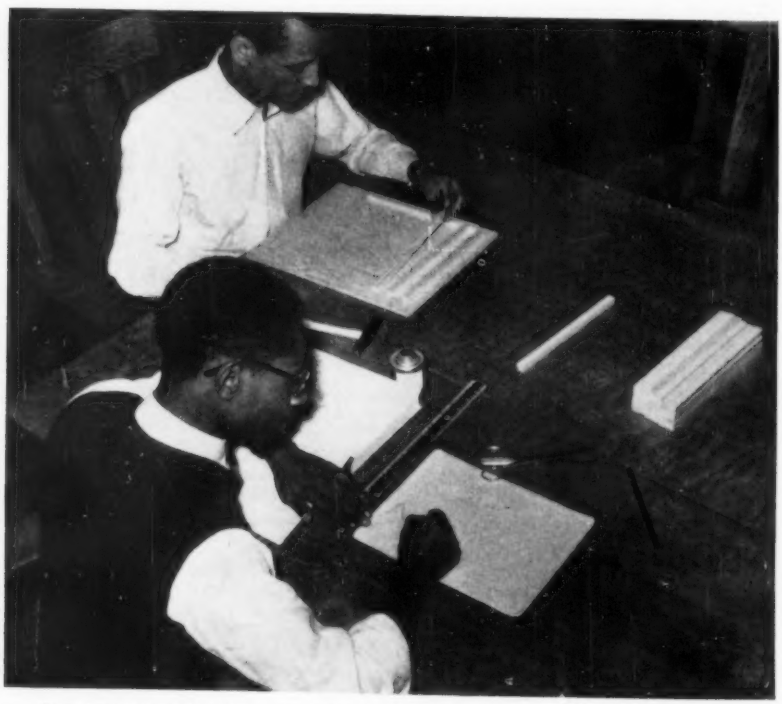

FIG. 2. While Mr. Mammo plots the elevations from the map on to the graph paper by use of an appropriate scale, Mr. Reta nails down a left, and top margin, of ½" square stock at right angles on the plywood sheet.

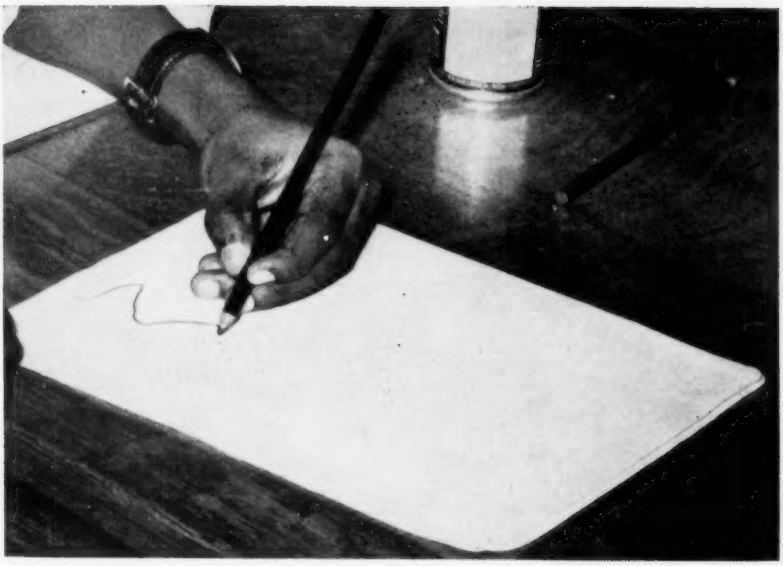

FIG. 3. A close-up view shows Mr. Mammo connecting the points of elevation plotted on the graph paper by a pencil line.

FIG. 4. Here we see all the plates cemented and placed in order prior to mounting on the plywood sheet.

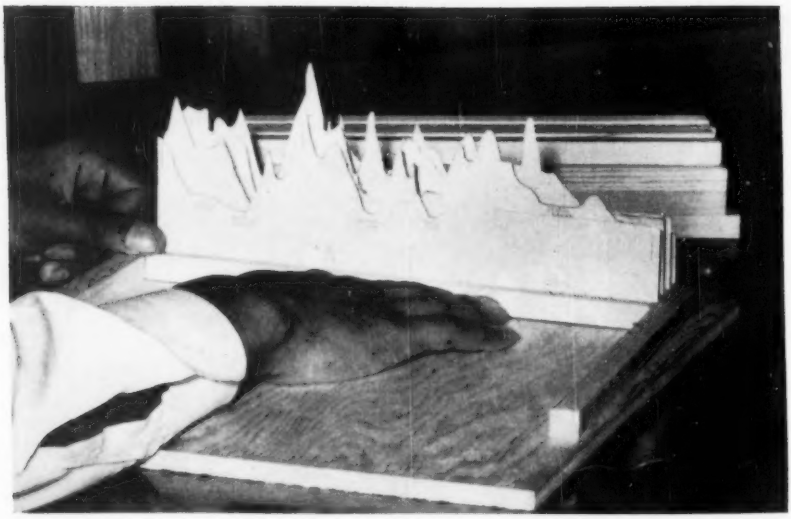

FIG. 5. Here we see a close up of several plates in place. Notice the left hand pulls the plate to the margin while the right hand slides the ½" stock up into position.

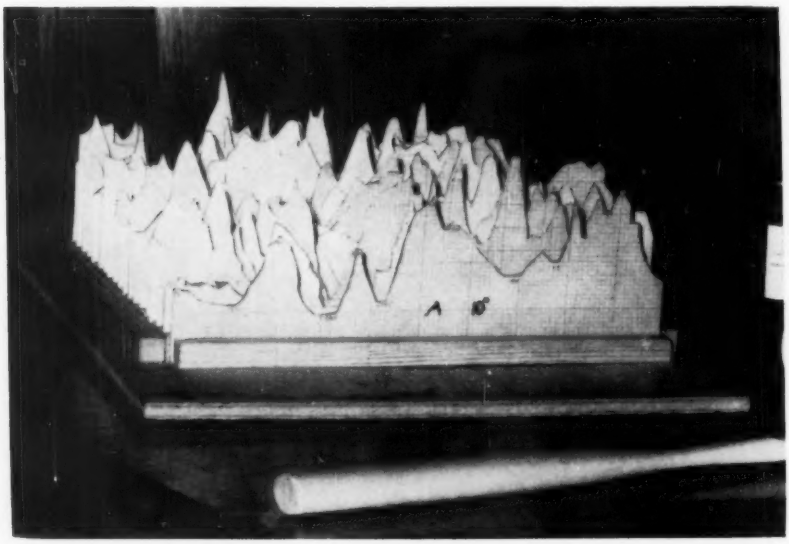

FIG. 6. The completed exaggeration is shown here. The severe and rapid changes in elevation are easily seen in comparison to the picture of imagination one would have to use in interpreting the straight, flat contour map. (In this case there is too much vertical exaggeration.)

A mutually agreed upon vertical scale is adopted and placed at the left hand side of the graph paper. Each student then proceeds to place dots to represent the corresponding elevations on his cross section. After this is done he connects the dots to get the profile of his cross section (see Figures 2 and 3).

The cross section is pasted on a piece of cardboard to give it a stiff backing. When placed in the final model it then stands erect. After all the cross sections have been cut they are arranged in proper order (see Figure 4). Strips of wood as wide as the interval between the cross sections are nailed to a base board and thus the profile strips are held firmly erect (see Figure 5). The final product may then be compared with the actual topographic map (see Figure 6).

Values of such a project include the fact that all students have participated, and if one has drawn a cross section incorrectly it stands out clearly. Then again, if the model is not constructed too permanently it can be disassembled, a new, different map selected in the next class and the project repeated. To use such a quickly made relief map before a local field trip is excellent. If the model is not taken apart the class can fill in the gaps between the vertical cross sections with Plaster of Paris and thus a permanent model is made, on which names or colors can be used. There are few teachers and students who are unable to make such a model as has been described here.

THE STOCK COMPANIES OF SOUTHWESTERN AUSTRALIA

T. P. FIELD
University of Kentucky

The agricultural districts of Western Australia are great in area (64,000,000 acres) and, because of the highly mechanized nature of the farms which use extensive farming methods, sparsely populated. To service the economic and technical needs of the agricultural community it has been the role of private enterprise and government agencies to organize a complex of business organizations. Among the foremost organizations serving the rural community are the "stock" companies (the word stock refers to livestock and should be read as an idiomatic expression rather than as a technical term) : Dalgety & Co. Ltd., Elder Smith & Co. Ltd., Golds-

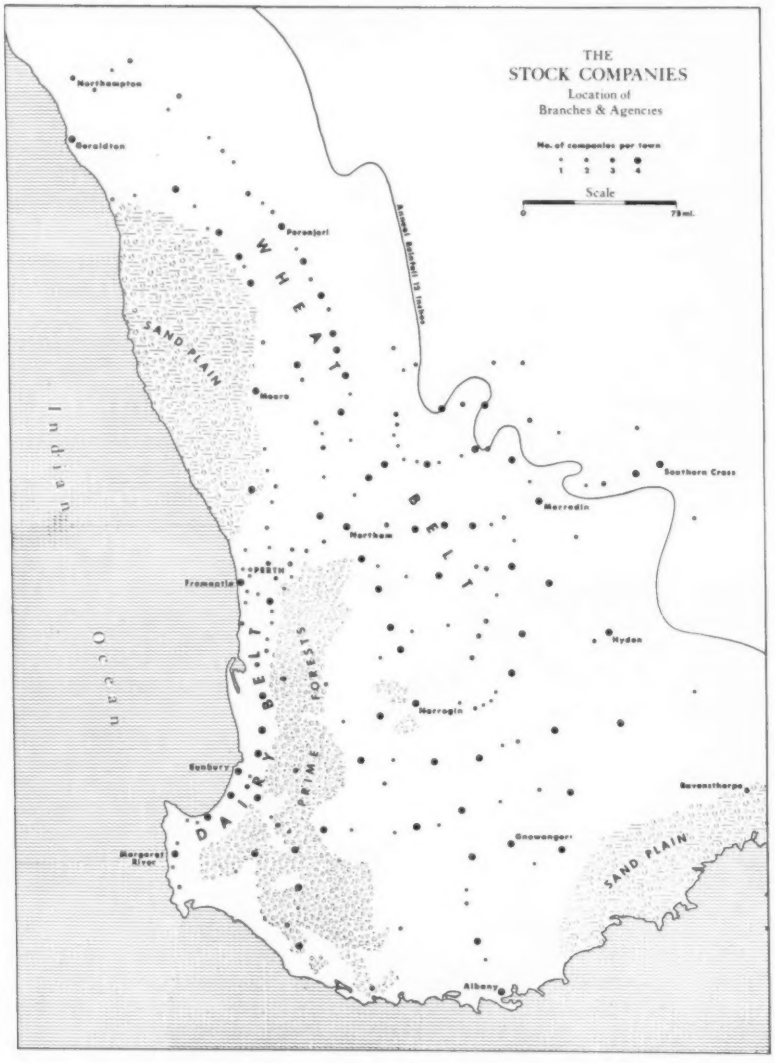

FIG. 1. The stock companies

brough Mort & Co. Ltd. and Westralian Farmers Co-operative Ltd. Each of these competitive firms seeks to make dividends for their stockholders by engaging in the marketing of agricultural products.

Conversely they act as commission agents for industrial and service organizations which supply and serve the farmer and public at large. There are a total of 191 communities served by at least one of the four companies in the agricultural areas and they are all represented in the pastoral country of the northwest. Even tho each company has representation in all geographic areas it is not unusual for a single company to negotiate over thirty-five per cent of the business in a given locality. Thirty-six per cent of the communities served by the stock companies have all four represented, twelve have any combination of three present, eighteen per cent have any combination of two present, and thirty-four per cent have only one company represented in the community. The average company is represented in one-hundred-and-twenty communities either thru a branch of the home office or an agency (Fig. 1).

The vast influence of the stock companies is readily understood when a compilation of their activities is examined. They are wool brokers, livestock agents, shipping and airline agents, insurance agents, property salesmen and general merchants. These categories cover such diverse goods, products or services as: cement, fencing, paint, rope, plywood, roofing, woolpresses, electric lighting plants, shearing equipment, timber, welding plants, explosives, agricultural chemicals, windmills, refrigerators and stoves—that is, anything necessary for the operation of the farm. They will book passage on selected shipping lines, conduct private and public stock and property sales, insure crops, property and lives, give agricultural and financial advice and, if necessary, counsel on domestic problems. Because the stock companies act in behalf of so many industrial producers and service businesses the agricultural producer, large or small, must, in some measure come within the scope of the stock companies enveloping activities.

Origins and Originators

Stock companies are largely of British colonial ancestry. Their origins are in the realm of trading and charter companies, merchant adventurers, and the cotton factors of the ante bellum South. The broad outline of their organization was imported but geography, economic conditions and colonial policies moulded them into unique Australian institutions. They borrowed magnitude from the charter and trading companies, acquired broad vision from their studies

and experiments in the vast and little known continent, worked with the flexible opportunism of the merchant advanturer and yet maintained the close personal contact and trust associated with the cotton factorage system. The profit motive inspired them to assess the potential of the land and then provide the means to realize the benefits of that potential.

The men who made the stock companies a success and who promoted the incorporation of many diverse and often unnecessarily competitive enterprises into a harmoniously operating machine, led exciting lives. Prerequisite to their later success in the business world was a thoro grounding in pastoral practices. Starting with scant knowledge of an infant enterprise they explored new lands, suffered hardships, took financial chances at what they considered to be good odds, succeeded as pastoralists, became managers of lesser commercial companies or agents of larger companies. When their company or agency was absorbed by the stock company they were frequently retained in a managerial capacity. It was also usual for them to be so sentimentally tied to England or Scotland that they would retire there as country gentlemen.

Development

The idea of a company acting as the agent for pastoralists and farmers is not original to Western Australia; neither were the present four companies the first to act as commission agents to the farmers of the state. The enterprise of individuals and small companies was sufficient during the early phases of the economic development of the state. A milestone in the agricultural areas of Western Australia was reached when, in 1889, the Great Southern Railway was completed and hitherto inaccessible lands were ready for development. The stock companies were quick to act on the economic opportunities presented in new and expanding agricultural lands. They were further stimulated by the activities associated with the gold rush of the 1890's. They had been schooled as the agents for interior pastoral properties, exploration, mining, transportation and similar work in the eastern states. Further, they were fully aware of the "boom and bust" cycle which characterized developmental attempts in unproved lands. They were thus technically and financially able to absorb the smaller existent companies and move wholeheartedly into the agricultural world. Being strongly pastoralist in origin they were slow to recognize

the importance of the "cocky" ("cocky" must be put into context to be understood. A cocky farmer is a small farmer, but a cocky gate is a fencewire gate as opposed to a proper metal pipe or board gate. The cocky gate is thus the poor (or lazy) farmer's answer to the gate problem. The word is said to have originated from the gregarious habit of the small farmers being like that of the cockatoo.) as a primary producer. The character of the international wheat market forced the retirement of the stock company method of handling of wheat, but in the handling of wool and livestock they have been eminently successful. In recent years they have moved heavily into general merchandise with considerable success.

MANAGEMENT AND OPERATION

The juxtaposition of the characteristic features of the stock company is achieved by combining the skill of traditional family management with that of the successful farmer who sits on the board of directors. As time has moved on the direct influence of the founding families has diminished in relation to that of company trained personnel. Present management is quick to remember that the initial success was achieved thru sound business practice mixed with first-name rapport between the farmer and the company representative. Tho the ordinary farmer can consult with top echelons it is at the level of the field representative that the closest of personal relations exist between the farmer and the company. Policy, finance and exploration into new aveunes of enterprise are the responsibility of management, but it is at the level of the field representative that the fortunes of the company succeed or fail. He is the man who must bring in the business.

Each company is distinct as to its internal organization but the similarities of results indicate that a high degree of uniformity must exist. The local home offices are well known landmarks in downtown Perth (Fig. 2). At Midland Junction are found the livestock sale yards and in Fremantle the wool and skin facilities. It is from Fremantle that the products of the land begin their journey to the consuming world, and it is thru this port that most of the merchandise handled by the companies is imported.

For a company to be properly represented in the dispersed agricultural areas, it is necessary that the home office be represented in strategically located country towns. The location of such a branch office is the out-of-Perth office with a staff of from two to thirty persons. On the other hand it is an operating agency

Fig. 2. Westralian Farmers Co-operative Ltd. Wesfarmers is the only co-operative among the four stock companies. Its establishment and growth are due largely to the efforts of one man, Walter Harper. The advertisements show Wesfarmers additional interest in automobiles and trucks.

equipped with sale yards, stock men and merchandising specialists —all facilities necessary to deal with the clients.

In other country towns are found agencies supported by salaried representatives of the company. These representatives are company trained and have risen in the company since their graduation from state or private high schools. They are the local representatives of the company and act in a supervisory capacity of the contract agencies in their district. Tho these company representatives may be junior to and less experienced than one of the agents under their supervision, they are nevertheless responsible for the technical administration of company policy and the internal harmony of their district. Much of the success of the company representatives is dependent upon the company's selection of the correct personality to match the temper of the community into which the new

man is sent. The hail-fellow-well-met type may be a huge success in one place and not as successful in another.

Lastly are the private firms which act as commission agents for the stock companies, by appointment and with the active support of company staff members who are experts in the particular problem at hand. A single company may have over seventy-five such contract agents. Should there be competition for a to-be-established agency, a firm which acts as general agents for machinery, oil, livestock, automobiles and life insurance would be given first consideration. Next in the selection would come the general store or hardware store which has agency responsibilities in compatible lines of merchandise and services. It should be noted that most of the large business firms in Perth are represented in the country thru agencies. Last on the list of preferences are the garages and service stations. Personalities and reputation can disrupt this pattern of preference and thus it is possible for a garage to be given first preference.

At present two opposing forces regarding agencies are active. First, the stock companies look with some disfavor upon storekeepers as their agents. These men usually have a wide range of interests and thus do not devote enough time and thought to the company's business. As transportation and communication facilities expand and improve it is possible for the company representative to service a larger radius and thus require fewer agencies. Second, the farmers of a local community have a primary interest in the development of their local trading center. Tho the larger center with a company branch may offer a wider range of goods, better prices, and more frequent deliveries of bread and green groceries and even dividends on co-operative shares, the farmer will support his local merchant. He reasons that such support will result in a general improvement in service, recreational and educational facilities in his community.

THE FIELD REPRESENTATIVE

It is at the ground level that the stock company really works even tho the finance and insurance departments may yield the greatest profit to the company. The field representative whether he is from the Perth office or a contract agency is the direct contact between the company and the primary producer. He is the man who knows the personality of the client, the ability of the client as

a farmer and some of the problems peculiar to his client's farm. This knowledge is necessary because the company bases the extent of financial assistance on the man rather than on the size of the man's farm operation. In several respects he is like the county agricultural agent in the United States because he so frequently acts in that capacity. Yet his work is different in that his activities must yield a profit to the company as well as increasing the productive capacity of the farm. It is generally understood among field representatives that competition without overt antagonism and conflict builds a stronger business world for all. These men are not hucksters but are intelligent agents often playing for high stakes.

It is usual for a field representation to operate over an area of one thousand to three thousand square miles and offer services to from fifty to three hundred clients. Early in the autumn he begins his working year. During March, April and May he services his clients for sales at Midland Junction. This is also the time for a general canvass or wool canvass, the latter usually being made with a company technical representative from the wool department. He also collects orders for the current season and works on general merchandise lines for which the company acts as agents. Fat stock services have a high priority during the autumn and winter because they are in short supply, prices are good and the local butcher needs a constant supply of meat. As the winter progresses the general merchandise canvass continues and, because lambs drop between May and July, fat lambs are sought in late winter for the high prices they command on the early market. During October the fat lamb sales reach their peak. With the rising temperatures of approaching spring shearing begins at the latitude of Geraldton and the field representative must concern himself with the off-shear sales. August thru December is a very busy period for the various company representatives who are concerned with livestock sales. Fat stock must be moved rapidly and farmers must be supplied with the necessary stock for the coming season. It is no mean task to match supplies with the complex orders received from individual farmers and assess the financial advances entailed in these orders. Early in the spring insurance transactions are completed and, as summer approaches, the continuing off-shear sales, the problems of transporting livestock to Midland Junction combined with the fat lamb sales bring the season to a hectic climax. The field representative is now ready for his annual leave.

A DAY ON THE ROAD

The field representative's day beings with office chores in connection with a scheduled day in the field. A day in the field can accomplish a great deal if it is well planned. Because he has the affairs of his clients well in mind he can often find some reason for a client to accompany him on the trip. His company furnishes him the car and watches his work from a distance. Beyond this he is free to adjust his mode of operation to the mores and personality of the community.

As he drives thru the country on hot, dusty, well maintained gravel roads he makes mental and verbal note of the landscape and the people who work the land. He seldom fails to know the productive history of a particular farm and the problems of the operators. As the scene changes and the conversation continues it is evident that each observation is fitted into the everchanging mosaic of the total community. Interruptions to the conversation are frequent as stops are made to pass the time of day with people along the road. Small details are noted and explored as each has a present or potential business implication—the state of a fence here, scotch thistle along a fence row, stray stock there, a dog with a lame foot, regrowth of mallee suckers on light land, the success of a local lad at Sunday tennis, vacation news of a client recently returned from Albany, the effectiveness of a new bulldozer in building farm dams, and recalling the time the new windmill was pulled down when an erecting guy-wire was left tied to the service truck. As he goes he makes arrangements for the sale of a mob of sheep—nothing definite but something to keep in mind for the next stock sale. The reason for the trip may be the assessment of a property and farm plant to be auctioned by his company in the near future. Here new skills are brought into play—what is the size and quality of this paddock, how many and how deep are the bores, what is the record of production, what improvement suggestions could be made at the time of the sale, is the house a detriment or an advantage to the property, the condition of the stock, reasons for the disposal of the property and, most of all, getting a clear statement of the terms of sale from the owner. When he gets back to town he will have to see the lawyer about such items as title and possible liens.

By the time the picnic lunch is over and the details of the property sale are in mind the trip back to town begins. If possible

an alternate route is chosen. A route may be possible which simply leads from house to house and is independent of the main road. It is usual for houses to be located off the road and near the center of a two to five thousand acre farm. The first gate is reached on the property line and after that a succession of gates between paddocks. This is not the route for a stranger for it traverses private property. Further, even tho the farmer would not mind

Fig. 3. Wheat Belt Farm. This is the farm of Mr. R. Jones which is located about 130 miles northeast of Perth close to the 12 inch isohyet. Mr. Jones does virtually all of his business with Elder Smith Co. Ltd. Over a period of thirty years, since he migrated from Victoria, Mr. Jones has continually developed and improved this farm. This house is constructed of "bat" bricks (adobe) with a roof of corrugated iron which has a wide overhang to make a wide veranada on all four sides. The kitchen is a separate building connected by a "dog trot" (to use a Tenn. mountain term). It is interesting to note the brick toilet building which is furnished with its own water tank. Kitchen water is obtained from the tank at the corner of the building. The odd thing is that the toilet is of the flush type but the kitchen does not have a sink—they just use a dish pan. This far east in the Wheat Belt they watch the rain guage in the autumn and when it has accumulated four inches they feel assured of a crop.

the trespass, the stranger would quickly become lost in the confusion of paddocks or get bogged down in unrecognized soft ground.

When the house is reached (Figs. 3 and 4) the friendly relations between the field representative and the farmer are immediately evident. The stranger is accepted simply because he is introduced by the field representative. If the day is hot an invitation to the cool, curtained lounge will be made. Here in the glareless quiet, over a cup of tea, business is mixed with casual conversation

until it is time to move over to the neighbor's house. And so the afternoon moves on to the usual visit to the "pub" for a beer and the end of the working day. It is quite probable that the day is not really finished until a report has been written.

Tho the trip has covered over one hundred miles the atmosphere

FIG. 4. Wheat Belt Farm. This is the farm of Mr. P. Overington which is located a little over a hundred miles north of Perth near New Norcia. This land was opened for Returned Soldier settlement in 1949-50 when a large estate was broken into four farms of about 1500 acres each. The house is of asbestos and frame construction with a corrugated iron roof. The utility shed under the water tower contains the toilet, laundry and the electric generating plant (32 volt DC). All of the equipment necessary to build and run this farm are purchased thru one of the stock companies.

has been so relaxed and casual that it is difficult to realize that the day's events and conversations are converted into profit for the company and their clients. Prices and terms of sale have been discussed but sharp trading practices were avoided. A satisfied and trusting client is preferred to the monetary large profit transaction which would result in dissatisfaction and loss of trust. A lasting business relationship is the ultimate goal.

ANSWERS TO THE CRITICS

It is impossible that organizations as large as the stock companies could exist without being subject to some criticism. The critics usually speak with considerable reserve if they are in any measure in competition with the stock companies. The view of the

general public is seldom clear but it seems to narrow into two general categories—the commission percentage and the size of the companies.

The critics point to the high commission percentage now in effect as being based on times when the volume of business and price of commodities were much lower. They suggest that the margin of profit is too high. The companies answer that everything has gone up in cost, and that it now costs four hundred per cent more to keep a field representative on the road than it did in the days of low costs. Further, that the high commissions charged assist to maintain the good service that the farmers have come to consider as normal.

The great size of the companies is also subject to criticism. The critics maintain that the general goodwill enjoyed by the companies was built, in the first instance, on close personal contact between the client and the personnel of the company and that the present size mitigates against close personal relations except when the farmer is really big himself. The company answers by first pointing to the large number of agents and representatives working to offer maximum service. They further point out that their size is an advantage to their clients. Spread out as they are they are in direct contact with buyers and sellers in the state and thruout Australia and they are thus supporting the most efficient system.

All in all there is an undercurrent of criticism which must have a healthy and stimulating effect on the operation of the stock companies—the businessman's answer of how to do business in a widely dispersed agricultural area.

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A SEQUENTIAL STUDY OF WEATHER AND CLIMATE IN A GEOGRAPHY CURRICULUM

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This sequential study of weather and climate, as one phase of geography, offers the following ideas as suggestions, realizing they are far from definitive. In a way this will involve the flashing before your eyes an assembled picture of a jigsaw puzzle, so that some notion of the whole will be gained and that the pieces will fit together into an organic unity. This presentation intends to formulate an approach but will make no pretense of stating ways or methods for carrying out this plan in all its particulars.

In order to make terms clear and to set up a base from which to progress, it might be wise to examine a few rather general definitions. First, a definition of geography, as given by the late Dr. W. Elmer Ekblaw—"Geography is the science of place, its attributes and their relationships." Weather and climate are attributes of place that most geographers agree are extremely significant. Weather, more or less descriptive in character, involves the condition and behavior of air at a given time and at a given place. Data for weather include such items as temperature, pressure, winds, moisture content of the air, cloudiness and precipitation. Meteorology, in contrast, represents the science of weather and applies physical principles to an explanation and interpretation of all varied weather phenomena. Meteorology and physics can hardly be separated and go hand in hand.

Climate is somewhat akin to weather in that it concerns itself with the average or general conditions of the atmosphere. Climate embraces a much more difficult and complex concept because it involves the combination and integration of the ever changing weather pattern and depicts a summary or resultant of all the many and varied weather factors. It, too, remains more or less descriptive in nature. The relationship to man and his activities proceeds from

here very easily. Climatology is related similarly to climate as meteorology is to weather for it encompasses a study of the phenomena of climate and treats the component elements of weather and climate such as temperature, precipitation and winds as they are distributed over the earth and the factors that determine and control distribution. Trewartha in the *Professional Geographer,* January 1957, wrote "Climatology is descriptive and explanatory. Genesis is an integral part, so that process is involved as well as form. The origin of climates, which is an integral part of climatology, cannot be understood without an appreciation of the operation of meteorological processes." You will note that a strong emphasis on weather and meteorology not only precedes the study of climate and climatology but also should accompany it.

First and Second Grades

The starting point for this suggested sequence begins with weather and a youngster is never too young to experience weather and to acquire some feeling for it. The first more or less formal teaching should attempt to make the student aware of his own experience in an exploratory manner. Children in the early grades enjoy keeping records of one sort or another such as length of day and night, sun in the sky, clouds. Not only do they like to explore and observe but also they love to collect and experiment—as for instance having wind move paper or sail boats. As they become increasingly interested in nature and its elements such as the moon, clouds, snow or rain, they commence to develop a scientific interest in causes and conditions as indicated by "Why." Fortunately weather is always present and close at hand so that observation and field work can be initiated easily just beyond the school door. As work progresses to the study of the community and mapping and directions are introduced, weather can still play an important part and wind direction, for example, might be plotted. But all this program is set-up to prepare the child for a more formal presentation of weather and climate in the 3rd and 4th grades.

Third and Fourth Grades

Every school should have some kind of a weather station available and it need not be elaborate because, at the third grade level, an introduction to weather instruments should be undertaken and regular observations of weather made and recorded. Altho still

pretty much descriptive, "Why" is coming more and more to the fore from the point of view of cause and effect and so, too, is "What" such as what is weather or what causes rain. From the records, charts and graphs can be constructed and this seems like an appropriate time for the collection of pictures. In a very short time students will be adept at discussing, in quite full detail, the weather of their locality and soon they will be able to relate daily weather to local activities. Thus can geography be introduced by showing the interrelationships of man and his environment. The next step involves the transfer of these immediate experiences to more distant and different areas so that in the 4th grade, climate and geography in broad belts such as tropical, temperate, polar, wet and dry, can be studied.

FIFTH AND SIXTH GRADES

Coming to the 5th and 6th grades the youngsters should be ready for a comprehension of world spatial relations and of some complex geographic patterns and associations. The introduction of seasons and the growing period should be made in these grades. The ability to read maps, graphs, and charts, with climatic information and symbols should have been well cultivated by this time and climatic maps including such items as average precipitation, length of frost free season, seasonal precipitation and temperature distribution should have considerable meaning. A continuation of weather combinations to bring out various types of climate, such as using examples of an average type of day being experienced locally as an average type day in a climatic region, will produce a much greater sensitivity to a situation, and comparisons of foreign places with the home setting can be made much more easily and will have much more value.

SEVENTH AND EIGHTH GRADES

By the 7th and 8th grades the students will have attained a world point of view and will be capable of appreciating a real concept of patterns of climate and the causes of the different patterns such as the wind belt system. Climatic maps with complex temperature and pressure arrangements and isotherms and isobars can be understood. A more scientific study of various weather elements, really an introduction to meteorology, can well be started at this point, beginning with a formal analysis of earth and sun relations.

Weather maps (synoptic charts) will challenge the students to the fullest as they try to assess the facts for knowledge of cyclones and anti-cyclones. The fronts on the maps will become vital factors in their everyday life as well as making them aware of a third dimension that they should be observing.

Senior High School

In the high school, from the scientific point of view, meteorology fits into the program very well. A good basic weather station with proper equipment should be provided. A strong tendency exists to emphasize meteorology in the general science courses and courses dealing with aviation, with somewhat less emphasis in the geographic field. At the high school level the students should have a full grasp and understanding of the fundamental principles involved in nearly all phases of daily weather and should be well into the realm of three dimensions. Observation, description and interpretation represent a logical sequence of thought for them. The implication of the atmosphere, the role of the sun in producing weather, air pressure and its effect on weather will become clear as the theory of cyclonic storms is analyzed.

From the geographic angle the resultant pattern of the distribution of the climatic elements—be it in a world or area study—should be clearly pictured in the student's minds. The factors that influence climate, latitude, altitude, land and water distribution, ocean currents, wind system, mountain barriers, etc. should receive full treatment.[1] Comparative geography can come into play now by considering the reasons for contrasts and similarities. The significant human aspects of weather and climate, such as the study of foods, clothing, shelter, health and energy, occupations, industries or transportation, follow in all the climatic work.

College

By the college period, young people should begin to acquire a good knowledge of the technical phases and the concepts of climatology for application to geography. This can be started in the basic or principles courses, stressed in the more advanced courses and even further detailed at the graduate level. This more thoro study of climatology, and its application by the graduate student, will tend

[1] Too often this must be taught in college because students have not had this at the high school level. The college faculties would prefer to omit this unit, but it is so essential they must continue to use their time to make up this deficiency.

to be more specific according to the major line of interest, as in the study of disease, agriculture, or urban geography.

In an undergraduate course on climate, there are many approaches but comments on a few phases will be made. Every class should start with about 15 minutes devoted to weather observations, not only temperature, pressure etc., but also with the release of an helium filled balloon. Almost everyday some principle or some application can be made to climate, to regional geography, to wet seasons, to dry seasons, to airplanes, to hurricanes and innumerable other matters. A little imagination (based on fact) can go a long way. All this encourages and strengthens the ability of the students, not only to observe in a critical fashion, but also to interpret and to analyze and to seek more application of their knowledge. Students have always enjoyed—more from the feeling of curiosity than from reason—all the many kinds of special winds such as the bora, mistral, sea breeze and chinook. Also they have a special curiosity about the past climates and the question of climatic change.

Climatic regions are most useful as a tool in generalization. What system is the most valuable is a moot question. A good beginning can be made by presenting a number of the early systems and then proceeding to those commonly used today. Actually it is not necessary to teach the Koeppen system in detail as so many do, but rather to study it as an example of one approach and the same holds for the Thornthwaite system. In each of the classifications the basis for the classification, the contrast with the others, and the value of each can be shown. In doing this students begin to appreciate the extent of climate and climatology, ways of approaching it, sequences and historical development.

Two situations exist here in regard to any specific place, first, how the place might be classified in a pattern and its relationship features, and secondly, how a place should be analyzed for an accurate picture of its actual climate. Logically it seems as tho the pattern belongs to an introductory course while the specific falls into an advanced course. A full analysis of the various climatic classification systems is for the graduate student or for the specialist, not for an undergraduate geography major.

RESEARCH

Research in climate divides well in two categories. First, research in physical climatology wherein an attempt is made to an-

alyze and interpret observational data in terms of cause and effect and, second, applied climatology in which the more immediate practical aspects are studied. In general, research in physical climatology comprises what might well be called pure science techniques. For instance, much of this is a question of mathematics. Statistics of many types and varieties are involved. Much emphasis has been placed on sequences and probability. Ratios, for example, of precipitation to evaporation, have come into greater prominence. The use of calculus to analyze functional relations advances constantly. The possibilities for increased use of functions and relationships for geography should be given much thought by geographers for this embraces an area of tremendous potential. In the past much of this work has been avoided because of the plethora of necessary computations. The electronic era with its marvellous machines opens up many new avenues of approach. What is essential at present are some trained experts who can schedule and program such work.

Two other phases of climatology might be mentioned to indicate more of the lines of research. Much work is being done, and more might well be done, in microclimatic studies. There is also a great deal to be accomplished in synoptic climatology, whereby situations that are responsible for spells of typical and atypical weather, are more thoroly studied and clarified. The military and air corps people are carrying out a quite complete program of upper air studies with much emphasis on the jet streams. Such information is filtering to the public in many ways and the weather sections in many newspapers now carry inset maps of the upper air winds.

Applied climate or climatology faces a number of problems but one of the most serious is probably that of proper techniques of study. These techniques are still in the stage of experimentation and are not devised in a clear fashion. Ellsworth Huntington is about the best known geographer who has carried out much research in applied climatology, so it might be well to start with the physiological phase. Much of the research in this line has stressed the heat balance of the human beings or of animals (today especially important in the tropics). In turn these studies lead to the need for more knowledge of heating and ventilation. The announcement of the degree days in weather forecasts reveals a practical application of such research.[2] The next sequence in this line of study goes on to research in housing and clothing.

Agricultural climatology has received a great deal of attention. The economic significance of this work is quite evident, especially in the forecasting of crop production such as wheat, maize, or coffee. This agricultural research is carried out on a broad base, but it is also being done on a small base where correlations between more or less microclimatic conditions and plant growth are being investigated.

Research projects in climatology as applied to other interests are too numerous to detail but mention might be made of two specific fields, medical geography and transportation.

CONCLUSION

In conclusion, may I suggest that all the study of weather and climate be taught, not only for the absolute knowledge of facts, but also for the sheer joy of everyday living that can come with such scholarship. I should like to emphasize the art of the subject matter that is so overlooked in this material age. This point can best be made by reading the following excerpt from "The Lost Woods" by Edwin Way Teale, entitled "In the Heart of a Cloud."

> If I were to choose the sights, the sounds, the fragrances I most would want to see and hear and smell—among all the delights of the open world—on a final day on earth—I think I would choose these: the clear, ethereal song of a white-throated sparrow singing at dawn; the smell of pine trees in the heat of noon; the lonely calling of Canada Geese; the sight of a dragonfly glinting in the sunshine; the voice of a hermit thrush far in a darkening woods at evening; and—most spiritual and moving of sights—the white cathedral of a cumulus cloud floating serenely in the blue of the sky."

[2] For example, from the teaching point of view, a check might be made of the amount of fuel used at the school over a period of time, and of the degree days for the same periods, to show the geography class, not only the relationship between these items, but also the practical application of such available information.

URBAN GEOGRAPHIC CONCEPTS AT ELEMENTARY AND SECONDARY LEVELS

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Some years ago this journal carried an excellent statement of the case for urban geographic training at the high school level.[1] In the period since that article, increasing numbers of "civics"

[1] Howard J. Nelson, "Urban Geography in the High School?" *Journal of Geography*, Vol. XLIX, No. 8 (November, 1950), pp. 313-319.

courses have been at least partially concerned with urban patterns and planning problems; even at the elementary school level "home community" units are being devoted to local urban area studies. At neither level of instruction is it usual for the teacher to be supported by adequate textual material. The spreading interest in urban studies and the general lack of suitable texts therefore make essential a consideration of what to teach and how to teach it. At both primary and secondary levels there is an obligation to impart simply and swiftly the basic geographic realities of the functional urban region—either as ends in themselves or as foundations to any local study project under consideration. Such local geographic realities are based upon broad urban concepts that the student must understand. At every level, then, the questions: What are the basic urban geographic concepts?; What can be said about them?; and How are they to be illustrated? must be answered.

The Basic Urban Concepts

Urban concepts which are self-evident to college students, and to many high school students, need to be carefully introduced at the elementary level and re-emphasized and expanded in high school classes. The students must particularly be made to understand that the city is not just a place of residence for a great number of people, but rather that it is an economic unit performing functions for an area and a population larger than the city itself. Not only is the city as a whole a functioning unit, but also it is made up of a series of separate land use areas each of which is the site of particular functions within the total urban structure. The students, therefore, must be introduced to the separate functional (i.e., land use) areas of cities; and they should be helped to see the dynamic role of transportation in the total economic life and internal structure of the city. These understandings—of economic purpose, of land use areas, and of transportation—need careful development and illustration, for they are basic to further stages of urban study. With them as a foundation, the elementary or high school group can be led on, if it is desirable and time permits, to matters of historical growth patterns, present suburbanization trends, problems of urban blight and renewal, etc. But these latter studies can be developed intelligibly only after the three basic concepts have been thoroly explored and understood.

The concept of the city as a functional unit—performing needed services for an area and population larger than itself—is perhaps

the most difficult for students to grasp. Two approaches might be employed to clarify the point. First, from the "common-sense" standpoint, the dependence of the urban population on imported food, fuel, etc., can be demonstrated. The obvious corollary of that dependence is the necessity for the city to do work (perform a function) needed by the area in which the city lies, so that income may be earned to pay for the needed imports. Second, from an historical standpoint, attention may be called to the increasing number of cities and the increasing proportion of our total population living in them. These increases may be related, in an historical resume, to the rise of manufacturing during the industrial revolution, the spread of mining and manufacturing in the United States, and so forth. The rise of cities as a consequence of regional economic development provides a concrete illustration of the way cities are created in response to regional needs.

The concept of urban function, therefore, has two parts: one, that the city is not a self-contained unit but serves the larger area and economy of which it is a part; and, two, that the functions performed by cities vary with the physical and cultural (particularly, economic) environment in which they develop. The apparent primary functions of the home city may be established by student review of its principal industrial products, trade activities, etc. From this review it can usually be quickly seen that any city's production or trade is obviously not designed solely for a local market. In a county seat or state capital, the political function can be shown to serve an extra-urban area; in a farm market community, grain elevators or implement stores are striking evidence of area-wide service.

The local community plus hypothetical examples can show the variation in urban function in different physical and economic environments. For example, the contrasts between a midwestern farm service center with its feed and implement stores and elevator, and the hotels, shops, and parks of a Florida resort center can be made obvious. Such regional and functional urban characteristics are of primary geographic interest and should be carefully developed as the key to later discussions of distribution of cities, growth and transportation patterns, etc.

The study of functional contrasts can also serve to introduce the primary and secondary students to a second basic concept—that of coherent internal urban structure. In addition to being an economic unit, the city is quite obviously an association of land uses

arranged in a recognizable tho not always orderly fashion. The functional whole, in other words, is made up of a series of interrelated functional parts each contributing to the success of the urbanized area.

Fortunately, not all of the details of the complex of urban land uses need be understood by the student before he appreciates the significance of functional interrelationships within the city. For the elementary grades it is enough to distinguish only the gross patterns—the retail function of the central business district, the residential areas as a single group, industrial and recreational uses, and so on. On the secondary level, the ancillary central business district functions (for example, business, administration, finance, hotel), the stratification of residential uses, variations in industrial areas, and so forth, may be introduced. At either level, working interrelationships and areal interdependence should be stressed, preferably by example and reference to the home community. Only thru reference to those interrelationships can the dynamic aspect of the urban community in its full geographic significance be understood.

Naturally, that dynamism implies movement of people and goods within the city, between the city and its served hinterland, and between different cities. In other words, transportation may now be introduced as a vital element in the functional organization of the urban area and as a portion of the city's total land use pattern. From the very simplest elements of transportation systems and routes as items of urban land use, as ways of travel between home and work and as means of bringing raw materials into and finished products out of cities, the discussion may be expanded to show the molding force of transportation in the location patterns of cities, in the internal structure of individual cities, and in their expansion patterns.

These concepts of urban function, of patterned land use, of transportation dynamics—are complex and, particularly at the elementary level, not fully understood when presented solely as abstractions. No generally available texts adequately present the concepts. Rather, they must be demonstrated by the individual teacher and presented in terms of the students' own experiences and knowledge. Fortunately, class discussion, local field trips and interviews, and generally available published materials can be easily used to relate the abstractions to the local scene.

CLASS STUDY OF CONCEPTS

The introductory concept of *urban function* may be approached thru a listing of the jobs of parents and family friends. Occupations revealing important urban activities not otherwise introduced may be mentioned by the teacher, and the resultant list divided into two parts—one containing basic, the other non-basic functions. These lists, with teacher guidance, can show the range of common urban functions and point out the differences between the basic activities which give economic support to the city by serving a regional or national population, and the non-basic functions which are carried on in any city to serve the urban population itself. Further, the basic list can be the springboard of discussion aimed at discovering the dominant functions of the home city. For elementary groups, the teacher should lead to the answer based on her own knowledge; for secondary groups, the investigation of urban function is a challenging opportunity for directed use of census statistics (where the size of the town permits) and for interviews with city officials.

A knowledge of the *functions* of the home community leads directly to the question: over what areas does the influence of the city extend? The trade and service areas concept is thus introduced and at any level of instruction those areas may be approximately drawn on a map (a state or county highway map may prove suitable). Group interviews or letters to local retailers, wholesalers, banks, newspapers, and manufacturers will usually provide enough general information to map a series of generalized service and trade areas for the various activities located in a town. The resultant map will suggest the variability of the town's several zones of influence, and can be used to stress again the areal and economic relationships of the town with the hinterland. The shape of service area boundaries will often suggest further discussion of the role of transportation, particularly highways, in the economic life of the community.

It is the study of *internal functional structure,* of land use, that lends itself most readily to class investigation and discussion.[2] The

[2] For some specialized applications of land use data, see: Mamie L. Anderzhon, "Geographic Field Work in Community Study for Junior High Level," *Journal of Geography*, Vol. LI, No. 8 (November, 1952), pp. 325-332; Bertrand P. Boucher, "Urban Land Use Maps: Their Role in the Social Studies Program," *Journal of Geography*, Vol. LIII, No. 3 (March, 1954), pp. 106-111; and Herbert L. Gross, "An Experiment in Home Community Geography," *Journal of Geography*, Vol. LIV, No. 8 (November, 1955), pp. 403-406.

insight into the functional and spatial interrelationships of a city gained by working with both gross and detailed land use maps can be achieved in no other way. Yet the benefits need not depend upon actual student mapping, desirable as that may be. A master plan (which for the built-up area is in general a map of existent uses), a zoning map, and the students' familiarity at least with the small home town, can all be drawn on to plot the gross pattern of land use. Field trips or team detailed mapping would, of course, be preferable.

Transportation can be shown as a dynamic element of the urban area thru use of city or county traffic flow maps (available from the state or, occasionally, the city engineer) and by transit company route maps. As an element of the city's land use pattern, reference can be made to the high proportion (generally about one-third) of total city area in streets and alleys, to the location of freight yards, passenger terminals, truck depots, etc.

Data from all of the mentioned sources can be plotted by the group on large scale street maps, usually obtainable from the city engineer. The final map then becomes the springboard for the achievement of particular unit objectives. For elementary groups these might be "land use in the school neighborhood," "where people work in our town," "main roads lead down-town" (using traffic surveys and transit maps), etc. For more advanced pupils, the centrality of the business district, the associations of transportation lines, terrain and industrial areas, or the variation in type and quality of residential districts are among innumerable study possibilities.

Conclusion

Urban areas, the homes of two-thirds of our population, are complex units that should be studied as a whole. City function, land use areas, and transportation patterns are the basic elements in the urban structure. An understanding and illustration of all three concepts should be part of any unit, at either elementary or secondary levels, that has as its objective the study of any phase of the urban community.

THE ROLE OF THE GEOGRAPHY TEACHER IN DEMOCRACY FULFILLMENT

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Geography has been defined as "the science of the description of the earth in its external aspects, dealing with its form and movements, physical features, climate and products, inhabitants, and natural and political divisions, and the population, industries, etc., of the various countries."[1] In recent years the definition of geography and geographic content have been broadened to include a wider emphasis upon the obvious relationship between man and his environment.[2] At the present time teachers can enlarge the field further to train young minds to play an important role in the process of democracy fulfillment. Since World War II it is becoming more apparent that geography has assumed a more significant and dynamic position in the social science curriculum of many schools and colleges.[3] In the past decades some social science teachers have given virtually little attention to the geographic basis or causes of the human problems of the world. This writer has been convinced for a long time that there should be a greater inter-relationship among the social sciences since many of them are designed toward making democracy fulfillment a reality.

GEOGRAPHIC FACTORS

It has been said that "any social science curriculum without geography is a romance in the land of nowhere." Teachers should observe, if not stress, the geographic factors which are involved in "making the world safe for democracy" and in making man's society more hospitable.[4] These factors can be introduced at many vital points in the Social Sciences, whether in economics, sociology, anthropology, political science or history. Then the geography and social science teacher would be contributing much toward world understanding and establishing a lasting peace based on demo-

[1] *The New Century Dictionary*, 1948, p. 648.

[2] C. Langdon White, *Human Geography*, Appleton-Century-Crofts, New York, 1948, preface.

[3] H. O. Lathrop, "Place of Geography in Social Studies," *Social Education*, May, 1945, pp. 209-12; J. W. Coulter, "Importance of Human Geography in Secondary Education Today," *Journal of Geography*, September, 1953, pp. 250-3.

[4] Karl De Schweinitz, *Man and Modern Society*, Henry Holt, New York, 1953, p. 1.

cratic principles.[5] In this connection, the geography teacher will be playing a vital role in democracy fulfillment[6] in the United States, in particular, and the world, in general.

Human Geography should be taught from the elementary and high school to college level as a required course since its integration with other courses can introduce students to different cultures. No general education curriculum can be considered adequate without it; and a teacher-training program that omits it is positively defective, as far as this writer is concerned. Geography is a broad, synthetic science for it borrows from basic earth sciences such as geology, meteorology, ecology and oceanography.[7] On the other hand, it employs knowledge dictated by economics, sociology, history and politics. Modern Geography then is partly physical and partly a social science for it seeks, among other things, to relate facts of the natural environment to facts and problems of the socio-economic environment. In this respect geography is one of the few sciences that attempt to bridge the apparently widening gap between the physical and social sciences.

Unique Role of the Geography Teacher

The position of geography and the geography teacher, altho a difficult one, is of rapidly increasing importance in the modern world. It is unfortunate that many American schools are far behind European schools in stressing the unique value of geography even in the twentieth century of fast world-wide contacts and changing human relations. The geography and social science teachers are in a positon to help students observe the socio-economic interdependence of people thruout the the world.

An understanding by American citizens[8] of the people, resources, conditions, and ways of life in other lands is necessary if they are to participate understandingly and effectively in world affairs; and in so doing promote the best interests of their own country. We hear it repeated that "World Affairs Are Your Affairs." Geography teachers and all individuals engaged in the education process have a duty to interpret this slogan for students to

[5] F. T. Carlton, "Toward Peace Between Nations and Within Nations," *Sociology and Social Research*, November, 1955, pp. 102-6.

[6] H. Kelsen, "Foundations of Democracy—Problems of Leadership," *Ethics*, October, 1955, pp. 30-2.

[7] *Encyclopaedia Britannica*, 1949, Vol. X, p. 139.

[8] Charles Malik, "Facing the Future—Some Issues for Americans," *Virginia Quarterly Review*, Spring, 1954, pp. 161-177.

whom they have been entrusted. Elizabeth Hoffman[9] posed this question in one of her articles: "Is it essential for the American student to be geographically informed?" Then she discussed (1) the need of enough knowledge about the environment of the earth to enable man to make successful adjustment to the forces and resources of nature; and (2) the necessity of learning enough about other peoples to enable one people to get along with the others. This second problem requires sufficient learning to make the attitudes and actions of other peoples seem reasonable and understandable. It must be remembered that characteristic attitudes and actions of human beings look reasonable only when viewed against the background of their unique environment and in the light of the problems emerging out of their relation to their environment.

The wide-awake teacher, regardless of his major field, should deviate from the beaten path of the curricular pattern. He should shift the subject-matter to fit into present interests in world affairs and to show variation in cultural patterns thruout the world. The student must recognize differences in foods, clothing, and shelter of various peoples in the different climatic locations. He must learn, furthermore, that these differences result in certain occupational adjustments; in the various wise and unwise uses of natural resources; and in social, economic, and political attainments of many types. The student, under the guidance of a good teacher, will learn that other peoples have developed along certain lines for definite reasons and he must know the geographical influences in order to understand and deal fairly with these other peoples. These differences make up the subject-matter known as "Human Geography." A survey of introductory geography textbooks seems to indicate that the subject-matter today places an emphasis, rightly enough, on the human phases of the field. If this is true, Human Geography should go a long way toward combating racial and religious prejudices and lead the path toward fulfillment of the goals of democracy in this transitional period of changing human relations.[10] Furthermore, "the diversity of the people who make up our population have made respect for the individual an American

[9] "Is It Essential for the American Student to Be Geographically Informed?" *Journal of Geography*, April, 1954, pp. 49-53.

[10] Alexander H. Leighton, *Human Relationships in a Changing World*, E. P. Dutton, New York, 1949; also H. C. Lindgren, *Effective Leadership in Human Relations*, Hermitage House, New York, 1954.

necessity since people of many races and creeds have made the country great. If there is a danger of dividing our nation, that danger does not arise from the diversity of our nationalities and creeds. Rather, it stems from our prejudices. Examples of our faults are not hard to find, but these faults in the practice of democracy are not the faults of democracy. They are our faults in that we have not lived up to the requirements of democracy."[11] The geography teacher must help students observe that the racial attitudes and prejudices of most people today need a drastic revision in light of modern geographic and scientific knowledge. Revision of these attitudes will do much to clarify numerous vexing questions in international relations as well as emerging internal national issues confronting us today.

Key to Wider Understanding

The geography teacher knows that his subject is the key to world understanding, international cooperation and democracy fulfilment. Today we live in a world in which no place is more than sixty hours from us. On a globe where circumnavigation has shrunk from years to hours within a brief moment in history's span, and where communication within the same span has shrunk from years to seconds, we have scant possibility of living alone whether we like it or not. It is essential that teachers help students grasp this all-important factor and its effect on future world relationships. In his quest for knowledge a student must come to realize that we as a nation can no longer bask sublimely in a sun of self-sufficiency, simply because we have lived in a region generously blessed with the advantages of geographical position, favorable physical features and rich resources. Because our air-age world is a comparatively small place, there are no longer nations which are our "distant neighbors." K. Kularatnam stated:[12]

> While the advancement of science and technology in the western hemisphere and particularly in America, is leading to the shrinkage of the world in relation to man, the collateral process of the expansion of concepts of mankind and human values is also expanding in ever-widening circles.

If we are to have a great era of peace, nations must cooperate,

[11] Eureal Grant Jackson, "Making Brotherhood a Reality," *The Quarterly Review of Higher Education*, Vol. 23, No. 4, October, 1955, p. 171; *Texas Standard*, Vol. 30, No. 1, January-February, 1956, p. 20.

[12] "America's Pressing Need," *The Social Studies*, March, 1956, pp. 89-90.

and this can come about only thru understanding other nations and peoples and their problems. Such an understanding[13] necessarily comprises a knowledge of those vital factors which determine man's pattern of life in the various regions of the world. The key to this understanding is contained in the new geography—a geography in which place becomes integrated with conditions of terrain, climate, temperature, rainfall, and other geographical factors vitally concerned with the study of the earth as the home of man. Geography is education for survival. It has been said that "the fate of civilization, even the survival of mankind itself, rests upon the race between education and catastrophe."

PROMOTION OF INTERNATIONAL GOOD WILL

As it has been indicated or implied previously, the geography teacher should be vitally concerned with international good will. He must show that Americans can demonstrate their good faith by coming to the aid of less fortunate areas of the world. George Santayana mentioned that Americans are "persistent in improving the instruments and methods of material economy; and it is precisely in this sphere that they would be called upon to act for the welfare of mankind."[14] On the other hand, a Harvard professor stated that:[15]

> The material basis is, of course, obviously essential to hegemony. But the current fashionable belief that today only the United States and the Soviet Union "count" is, at least, as erroneous as the belief that only economic power counts. Indeed, the safest generalization is that leadership cannot be attained and certainly not maintained if the effective public opinion of a great majority of the other states . . . reject such leadership.

The geography teacher must help students to see that American leadership depends, in a long run and among many other variables, on what the majority of the people of the world think of us.[16] If we expect to maintain our hegemony in democracy fulfillment and world affairs as well as command the respect of most nations in this confused world, we must try to understand other peoples of

[13] G. D. Stevens, "Geography—Path to World Understanding," *Journal of Geography*, October, 1955, pp. 359-62; M. Benary-Isbert, "Need of Understanding in Our Shrinking World," *Horn Book*, June, 1955, pp. 166-76.

[14] *Dominations and Powers—Reflections on Liberty, Society and Government*. Charles Scribner's Sons, New York, 1951, p. 10.

[15] Crane Brinton, "The Last Hegemony," *The Virginia Quarterly Review*, January, 1951, p. 8.

[16] Stewart S. Morgan, *Opinions and Attitudes in the Twentieth Century*. Ronald Press, New York, 1948, p. 1.

the earth so that peace and good will may result from our living together in one world. If teachers everywhere can get students to learn about peoples of various countries, about their physical conditions, land-forms, water features, climates, resources, occupational adjustments, history, social and political problems, this will be a more understanding world—a more peaceful world in which to live. Geography and social science teachers will, then, have completed at least part of their mission toward international harmony and democracy fulfillment in this transitional era of changing human relations.

A LABORATORY EXERCISE IN AERIAL PHOTO INTERPRETATION

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Modern geographers recognize aerial photographs as an invaluable teaching device. They are becoming more and more common as textbook illustrations. Consequently, it is important that students of geography have some understanding of the principles involved in aerial photo study, and know something of their uses and limitations.

At first glance, objects on aerial pictures look unfamiliar. However, a little practice with an inexpensive stereoscope and a stereo-pair of pictures reveals a surprising amount of accurate information. For stereoscopic study, two pictures of the same object, each taken from a slightly different position, are required. When laid alongside each other with the object to be studied on the pictures spaced apart the same distance as one's eyes are spread, stereo-vision becomes possible. The principle is the same as that employed in the stereo-camera, and the old-fashioned "parlor stereoscope." The pictures must be placed so that the shadows fall toward the observer. Reversing them makes hills look like valleys, and valleys become hills. In identifying specific features, characteristics of size, shape, shadow detail, tone, and pattern of arrangement are especially revealing.

Ability to identify objects in aerial pictures is largely a matter of applying personal experience. We know, for instance, that railroads follow long, sweeping curves, and that rivers normally

follow winding, sinuous courses. A useful rule is that natural landscape features are usually characterized by curved or crooked lines, while cultural features commonly have angularity and regular geometric patterns. Sometimes shadows cast by the object are more revealing than the image itself, often indicating the presence of objects which might otherwise be overlooked. The appearance of an object on a photograph depends largely on the quantity and quality of light reflected by it to the camera lens. The greater the reflection, the lighter an object will appear. Some characteristic tonal values of natural objects are that plowed land is lighter than grassland or forest, wet land is darker than dry land, deciduous forest is light in winter and dark in summer while coniferous forest is dark the year round. Lakes and streams are nearly always dark in tone. Since cultural features vary so in color, materials, and type of surface, generalizations concerning their tonal qualities are less useful.

Sometimes the scale of a picture is so small, or the photography so poor, that interpretation is difficult. In such cases, characteristic patterns of arrangement of features may be the best clue to their

FIG. 1

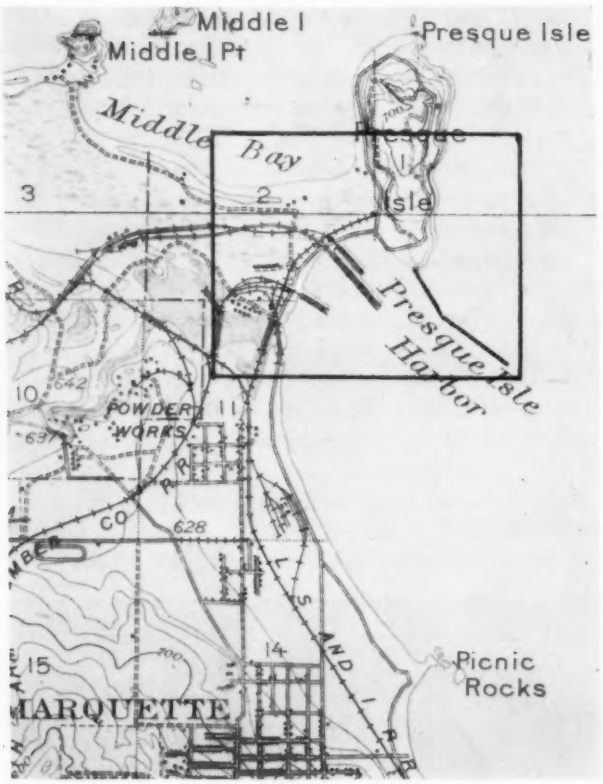

Fig. 2

identification. For instance, a dendritic arrangement of black lines strongly suggests a river system, since streams nearly always have a very dark tone on aerial photos, and the dendritic pattern is almost unique to natural drainage systems.

The writer has used the following exercise to acquaint students with elementary principles and techniques of aerial photo interpretation. Altho freshman college students were involved, the exercise is simple enough to use at a high school level.

Materials and Procedures

Inexpensive hand stereoscopes can be purchased from any of several manufacturers. With a few minutes of instruction and

practice, nearly everybody can see the third dimension. Several duplicate sets of stereo-pairs of the local area should be obtained, and an equal number of U. S. Geological Survey topographical maps of the same locality. The photo scale should be no smaller than 1:20,000. A scale of 1:10,000 is ideal. The pictures should be printed on glossy paper. The military services and various federal and state agencies retain negatives covering every locality in the United States, and will furnish prints at reasonable cost.*

Trim the margins from the pictures, removing the scale if given. Mount the stereo-pair on a piece of stiff cardboard by stapling the outer edge only of each picture. This provides a maximum area for stereo study by means of "flipping" the overlapping center strip. Cut out a convenient portion of the topographic map in the area containing the photos. Mount it on the same cardboard below the stereo-pair, retaining the same orientation and including the map scale.

Exercise 1. Determining Photo Scale

(1) By comparing photo distance with map distance.

Pierce two well-defined, separated points on the photo with pin pricks circled with ink (points A and B on the illustration). Avoid the margin of the pictures, where distortion is at a maximum (the accompanying stereo-pair has been generously trimmed). Measure this distance, using any convenient unit on the scale (e.g., 217/50's inches on illustration). Using the same unit, measure the distance between the same points on the map (e.g., 73/50's inches). The following formula solves the problem:

$$\frac{\text{photo distance}}{\text{map distance}} \times \text{map scale} = \text{photo scale}$$

$$\frac{86/50}{29/50} \text{ or } \frac{86}{29} \times \frac{1}{62{,}500} = \frac{86}{1{,}812{,}500} = \frac{1}{21{,}080} \text{ photo scale}$$

(2) From a known distance or dimension on the photo. Using this method an accurate scale determination can be easily made, as in the following example:

* The best single source for obtaining good quality aerial photographs for practically any section of the United States is the Performance and Aerial Photography Division, Commodity Stabilization Service, U. S. Department of Agriculture. Orders for pictures of the Rocky Mountain States and west should be sent to the Western Laboratory, 167 West Second South, Salt Lake City 1, Utah. Pictures of the eastern states are obtainable from the Eastern Laboratory, Washington 25, D.C. The cost of a 10 inch × 10 inch glossy print is 65 cents.

Known dimension—1160 feet (ore dock ore pocket section, "C" on photo)
In scaled units—33/50's inches
1/50 inch =1160 ÷ 33 = 35.15 feet
1 inch = 35.15 × 50 = 1757 feet = 21,090 inches
Scale of photo = 1/21,090

Exercise 2. Making Measurements on Aerial Photos

After the student has determined the scale of the photograph, he is ready to make measurements on it. This can be done with surprising accuracy for even small objects and distances. A decimal rule or "engineers scale" is more convenient than the familiar "architects ruler." First, a convenient unit of measurement, such as a fiftieth of an inch, is selected, and the number of feet in it calculated. The method shown in the second part of Exercise 1 can be used in this determination. Measurements should be practiced with and without stereo. The edges of the pictures, where distortion is greatest, should be avoided. Accuracy of measurements should be checked against known distances or dimensions, and against the same distance measured on the map.

If there are differences in heights of prominent adjacent objects, the student can be asked to examine them in stereo and to determine which is the higher of the two. ("D," the approach to the ore dock, and "E," the engine round house, on photo.) This is a good test of his ability to "see" the third dimension.

Exercise 3. Interpretation of Cultural Changes

Usually the topographic map and the pictures will be dated far enough apart so that there will be observable changes in the cultural landscape. In most instances, the pictures will be more recent than the map. An exercise which captures student interest is one in which he tries to identify these changes. These will consist in part of features on the map such as railroads, roads, bridges, and buildings which have vanished on the pictures. Conversely, items missing from the map will appear on the photographs. In case the photos cover a large area, certain portions of the map which contain the most conspicuous cultural changes may be designated for study. Section numbers are especially useful for this purpose.

With this elementary introduction to some of the basic principles of aerial photo interpretation, students will be better prepared to appreciate the value of aerial pictures, and to read them more intelligently wherever they may be encountered.

THE NATIONAL COUNCIL AT WORK

The forty-third annual meeting of the National Council for Geographic Education will be held in the Jefferson Hotel in St. Loius, Missouri on November 29-30, 1957. An abridged and preliminary program follows.

Theme: THE FORWARD LOOK IN GEOGRAPHIC EDUCATION

Friday Morning ..... **General Session**

GEOGRAPHIC EDUCATION IN A CHANGING WORLD

Changing Emphases in Geographic Education ..... Henry J. Warman
Forces Contributing to Changes in Geographic Education ..... George B. Cressey
Population Growth and Its Impact on Geographic Education ..... H. Phillip Bacon
Report From The Third International Conference of Geography Teachers .....
..... R. S. Funderburk
Goals in Geographic Education in the United States:
A Preliminary Report for the I.G.U.
Panelists: Clyde Kohn, Margaret Carlson, Adah Flemington and Herbert Gross
LUNCHEON: Guest speaker will be Mamie Anderzhon reporting on her year in India.

Friday Afternoon ..... **General Session**

THE ROLE OF THE TEXTBOOK IN GEOGRAPHIC EDUCATION

How Textbooks Influence the Curriculum in Geography ..... Raymond H. Roberts
How the Curriculum Influences the Textbook in Geography ..... Robert N. Saveland

Sectional Meetings

One Section will be devoted to the problem of using the geography textbook at various grade levels.

Leaders of Panels:
Primary Grades: Neva McDavitt
Intermediate Grades: Harriet Ruth Long
Junior High School: Mary Jo Read
Senior High School and College: William Stevenson

New Tools and Media in Geographic Education

A most interesting program has been arranged by the NCGE Committee on Television for this sectional meeting. The program considers the problems of organizing and presenting geographic materials via television and reports on the work accomplished by the members of the Committee on Television.

Glimpses of Lands and People
At Home and Abroad

Missouri's Ozark Highlands ..... John W. Conover
Some Aspects of the Brazilian Iron and Steel Industry ..... Sidney Ekblaw
Other areas will also be presented at this sectional.

MEETINGS: Gamma Theta Upsilon and open meetings of some NCGE standing committees will be held.

Annual Banquet

Guest speaker will be Thomas F. Barton, Editor of the JOURNAL OF GEOGRAPHY.

Saturday Morning ..... **Coordinators Breakfast**

The Director of Coordinators, Herbert H. Gross, will meet the State Coordinators at a breakfast meeting. Everyone interested in this program is welcome to attend.

Saturday Morning ..... **General Session**

Recent Research in Regional Geography

Geography Begins at Home On the Gulf Coast ..... Dorothy Sorrels
South Pass—A Geographical Myth ..... James E. Vance
The Pollution Problems of the Passaic River ..... David Jacobson

The General Assembly

This is the annual business meeting of NCGE. Only members attend.

Saturday Afternoon

Field trips and excursions.

St. Louis is a city where north and south, east and west meet. Plan now to attend the annual meeting of the National Council for Geographic Education to be held in the Jefferson Hotel. You will be glad you came.

Ina Cullom Robertson, *President*

GEOGRAPHICAL PUBLICATIONS

L. Dudley Stamp and S. Carter Gilmour, **Chisholm's Handbook of Commercial Geography,** 15th edition, Longmans, Green and Co., New York, 1956. xiii and 915 pages with maps, diagrams, tables, and index. $16.00.

This handy reference book follows the pattern of previous editions in presenting concise, factual paragraphs about major commodities and their exchange and the political units of the world. The new edition a demand for which is claimed by the authors, contains remarks on the restoration of sovereignty to West Germany and Austria, the settlement of the Trieste problem, a brief section on the Saar, and similar items to differentiate it from the earlier editions. In view of the space devoted to these additions, the question may well be raised whether a new edition, rather than a reprint, is actually required.

While the statistical data is recent (as late as 1954 in some instances), several portions of the textual material are out of date. For example, the statement which implies that all cotton in the United States is picked by hand, the omission of Ecuador as the present leading commercial producer of bananas, and the failure to mention the utilization of the iron ores of northwest Australia provide three cases in point.

Anyone wishing to check on particular facts about places or commodities will continue to find this a convenient volume to which to turn, tho it should not be considered as a final authority. Surely the geographer, business man, or library lacking the earlier edition will find this volume an asset to their reference material.

Ohio State University

S. Earl Brown

Shannon McCune. **Korea's Heritage: A Regional and Social Geography.** Charles E. Tuttle Company, Rutland, Vermont and Tokyo, Japan, 1956. Printed in Japan. 250 pages with illustrations, appendices, and index. $5.00.

Shannon McCune is probably better equipped than any other American to write on the geography of Korea. Born of missionary parents in Korea, he spent his boyhood in that country. Later, as a graduate student at Clark University, he took the subject of the climatic regions of Korea for his Ph.D. thesis. In connection with this study, he did field work in Korea in 1938-39. During 1954 Dr. McCune did further field study in Korea.

The intimate acquaintance which Dr. McCune has with this relatively small country (85,000 square miles) is evident thruout his book. He manages to convey a feeling for the country and for the people, while at the same time he deals objectively with the

problems which they face. The author's thoro, first-hand knowledge of the country no doubt helps to account for the penetrating simplicity of the work.

The main body of the text is organized into eleven chapters, which cover the following topics: location, physiography, historical development, political pattern, population pattern, the people and their way of life, the basic Korean economy (agriculture, fishing, and forestry), the modern industrial economy, and the regions of North and South Korea.

The very fact that the book includes nine carefully prepared appendices is evidence of the thoroness of the work. These include bibliographical references and notes, notes on place names in Korea, and data on rivers and drainage basins of Korea, on mineral and hydroelectric power resources, and on recent industrial production (up to 1953) in South Korea.

The book is amply illustrated with twenty-one maps and charts, and with ninety-five excellent photographs.

Korea's Heritage: A Regional and Social Geography is a welcome addition to the geographic literature on Korea. It will be of value to teachers at all levels, to students, and to the lay public.

Central Washington College of Education
Ellensburg, Washington

R. S. FUNDERBURK

H. W. Swinnerton. **The Earth Beneath Us.** Little, Brown and Co., Boston, 1955. 335 pages with sketches and index. $5.00.

Professor Swinnerton has written a book which will join the increasing number of publications that have as their purpose the popularization of the sciences concerned with planet Earth. Within 323 pages of actual text he surveys the story of Earth from theories of its beginning thru its changes, and the changes on it, to the present day.

This tremendous task of telling informally the story of the Earth and its changes is organized into six parts: The Origin of the Earth, The Face of the Earth, The Realms of Pluto, The Climates of the Past, The Procession of Life, and The Coming of Man. The phraseology of each part indicates the informal style of the book.

The absence of photographs and paucity of sketches is disappointing when one considers the purpose of the book. It is also surprising that a topical study of global features, would include only one small sketch map.

Many examples are given for the phenomena discussed. The author, a professor emeritus of geology and geography at the University of Nottingham, has used examples from many parts of the world. However, the greater majority are taken from the British environment. This should offer to American readers an advantage, possibly not found in books of this type published in this country.

Professor Swinnerton has managed to include many more concepts from the fields of astronomy, geology, climatology, biology and anthropology than one might reasonably expect. This book should fulfill its purpose well in stimulating its reader to delve further into the earth sciences.

University of Texas
Austin, Texas

LORRIN KENNAMER, JR.

T. Walter Wallbank. **Man's Story. World History in Its Geographic Setting.** Scott, Foresman and Company, 1956. 768 pages, with 16-page, full-color map section; spot maps, time lines, photographs, cartoons; study aids, annotated reading lists, and audio-visual aids listings; ten geographic settings. $4.48.

This is not a new high school history text, but it is not merely a reprint. It is a new edition with historical information brought up to 1956. The informative text, the historical atlas introduction, the attractive format, the time-lines, the outline of purpose at the beginning of each chapter and the summary at the end, the fine photographs (occasionally reduced in value by a misapplication of available color), the amusing cartoons, the study aids, the reading lists, the audio-visual suggestions are all laudable, but the geographer's chief interest is the subtitle—"in Its Geographic Setting." The author of *Man's Story* conceives of geography as being concerned only with the physical and spatial elements of the world, not the human. Altho this narrow interpretation of geography tends to irritate, nevertheless, the concern for the presentation of man-land relationships in a history text is gratifying. The maps, by and large, are good; however, better use of color in the historical atlas section would have made interpretation easier.

Concordia Teachers College
River Forest, Illinois

HERBERT H. GROSS

W. G. V. Balchin, edited, **Geography and Man.** Pitman Publishing Corporation, 2 West 45th Street, New York 36, New York. 1957. Three volumes containing 1368 pages with illustrations and index. $39.50.

The *Geography and Man* is intended to be a practical survey of the life and work of man in relation to his natural environment. This monumental work, appearing in three volumes, is edited by Dr. Balchin assisted by 75 authorities. Volume I deals with the heritage of man and with continental Europe. The British Isles, Asia, and Africa are treated in Volume II, and Volume III discusses the Americas, Australasia, and a section treating Man's Work and Industry. The last volume also contains an index. All three volumes contain many excellent illustrations (some in color) including maps and diagrams. The authors are to be congratulated on the great work that they have produced. In the opinion of the writer, these volumes are a must in any geographical library.

GEORGE J. MILLER

Indiana University

Simon Kuznets, Wilbert E. Moore, and Joseph J. Spengler, Ed. **Economic Growth: Brazil, India, Japan.** Duke University Press, Durham, North Carolina, 1955, xi and 602 pages, including maps, tables, and index.

This excellent series of papers emerged from a research conference planned by the Committee on Economic Growth of the Social Science Research Council in 1950 and held in 1952. Participants included a geographer, an anthropologist, several demographers, economists, economic historians, and sociologists. Thus, the report has the value of various disciplinary approaches as they merge and depart.

The choice of States provides examples of economic growth as affected by quite different historical experiences and endowments. Brazil, India, and Japan are examined in three phases: (1) agricultural, industrial, and related economic trends in the last half to three-quarters of a century; (2) demographic factors, including numbers, density, composition, growth, and skills; (3) and, the trends in business organization, relationships between business and government, and the influence of social structure upon economic growth.

Those geographers who are inclined to analyze economic development narrowly in terms of resource availability can widen their horizons by critically reading Chapters 11 to 18. Topics in these sections consider, among others, the effects of political subordination

of India on industrialization, the relationship of feudal society and the industrial metamorphosis of Japan, and the influence of economic nationalism on the industrial progress of Brazil. On the other hand, those who desire to compare the natural resource bases of these countries will not find the requisite materials in this book. Climate and health are assigned brief notice.

The papers sharply illustrate the unique personalities of the chosen units of study. It is the uniqueness of total experiences of regions which invites comparative study on an even finer basis than has been possible in this volume. As always, one of the cruxes will be to uncover comparable data. Perhaps this is one reason why the study has a sparcity of comparative maps. One may hope that additional areal differentiation investigations will be encouraged in order to consider other regions and other indices of economic growth, and to contribute to provocative reading.

JACK C. RANSOME

Indiana University

A. C. O'Dell. **Railways and Geography.** Hutchinson and Company, Ltd., London, England, 1956, 198 pp.

The title of this book, saves the author from possible criticism on the grounds of its geographical weakness. At first glance, the title, and the fact that the author is a professor of geography at the University of Aberdeen, may well lead the reader to suppose he will be regaled with a treatise on the role of geography in railroading. But the realization of this speculation is only partially borne out.

Chapter I which treats with "The Track," and Chapter II with "The Railway Men" are hardly geographical. Chapter III "The Land and the Rail" contains some geography and also geology. Subsequent chapters do better, even tho they bog down now and then, until once again in Chapter VII, "Services," the geography is scarce, as is the case largely in Chapter VIII "The Urban Pattern" and the final section, Chapter IX "Rivals to the Rail."

Inasmuch as the volume is one in the series constituting Hutchinson's University Library, it is understandable that so much of the content, which treats with matters obvious to the adult, has been included and presented with little profound embellishment. The fact that landslides, poorly drained lands, rivers, winds, fogs, hills and mountains present problems to railroad builders and operators are no doubt, appropriate items for consideration by youth, and if this be the audience involved there can be little objection to their presentation as such.

Even tho we grant, the author has accomplished his mission, we can not refrain from noting that so much of the book is economics, engineering, politics and other things that any person, student or otherwise, may well gain the impression these aspects are phases of geography as well. Herein lies one of the great weaknesses in the realm of geographic writing and teaching. Insufficient care has been shown in the crystallization of geographic thought and making certain that where desirable to associate the non-geographic with the geographic, the reader or listener be made fully cognizant when departures are made from the latter aspect. And incidentally, we must note again, as we have regretfully so often done in the past, when reviewing books published in England, the absence of indicators of latitude and longitude on drawings which purport to be "maps."

As a brief compendium of information concerning railroad facilities of the world, the book serves well and should have value in most school libraries.

EUGENE VAN CLEEF

Ohio State University
Columbus, Ohio

GEOGRAPHICAL PUBLICATIONS RECEIVED

Lydia Davis. **South Sea Holiday.** Little, Brown & Company, Boston, 1956. 204 pages with illustrations. $2.95.

The adventures of Mandy and Michael while sailing with their father in a schooner to the far islands in the Pacific, for the intermediate reader.

Bud Helmericks. **Arctic Bush Pilot.** Little, Brown & Company, Boston, 1956. 180 pages with photographs. $3.00.

Written for the intermediate reader, this story continues the adventures of a young Arctic pioneer.

H. Percy Wilkins. **Clouds, Rings and Crocodiles.** Little, Brown & Company, Boston, 1956. 148 pages with illustrations. $3.00.

Certain amount of speculation with facts about the planets which science has disclosed. Tale of an exciting voyage while it teaches the elements of astronomy.

Sam E. Clagg and Robert L. Britton. **West Virginia Atlas.** Marshall College, Huntington, West Virginia, 1955. 49 pages with index. $1.50.

Maps of importance to geography, history, and civics of the state of West Virginia.

Sir Leonard Woolley. **Dead Towns and Living Men.** Philosophical Library, New York, 1956. 220 pages with photographs. $6.00.

This book, long out of print, has now been revised. It is written mainly about people whom Sir Leonard met while excavating dead towns in Egypt, Italy and Syria.

M. Y. Nuttonson. **Wheat-Climate Relationships and the Use of Phenology in Ascertaining the Thermal and Photo-Thermal Requirements of Wheat.** American Institute of Crop Ecology, Washington, D.C., 1955. vii and 388 pages with tables, charts, maps and index. $3.50.

Based on data of North America and of some thermally analogous areas of North America in the Soviet Union and in Finland. This study was sponsored by the United States Weather Bureau.

U. S. Atomic Energy Commission. **Major Activities in the Atomic Energy Programs, January-June 1956.** xix and 260 pages. $1.25 from Superintendent of Documents, U. S. Government Printing Office, Washington, D.C.

Shannon McCune. **Korea's Heritage, A Regional and Social Geography.** Charles E. Tuttle Company, Rutland, Vermont and Tokyo, Japan, 1956. xiii and 250 pages with maps, photographs, tables, bibliography, and index. $5.00.

This book aims to present geographic knowledge of Korea because it is needed if sound decisions are to be made concerning this area and it is so important in the lives of the Koreans. Dr. McCune was born in Korea.

Harry Edward Neal. **Nature's Guardians, Your Career in Conservation.** Julian Messner, Inc., New York, 1956. 192 pages with photographs, bibliography, list of conservation organizations, and index. $3.50.

Written for the young man of high school or college age, this book gives complete information about opportunities in conservation as well as guidance for selecting a profession in line with his interests and talents.

Kenneth B. Cumberland. **Southwest Pacific.** McGraw-Hill Book Co., Inc., New York, 1956. xviii and 365 pages with maps, tables, photographs, glossary, and index. $6.50.

This geography of Australia, New Zealand, and their Pacific Island neighborhoods, points out how commercial interests have not only developed international and local trade in the Pacific but also have disrupted native economics.

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SVE. **Living in Australia & Pacific Island.** The Society for Visual Education, Inc., 1345 Diversey Parkway, Chicago 14, Illinois. 1956. Four filmstrips. $19.00.

The filmstrips cover Australia, New Zealand, Hawaiian Islands, and the South Pacific Islands and Antarctica.

Valene L. Smith. **European Travel Geography.** Lucas Brothers, Columbia, Missouri. 1956. 60 pages with maps, illustrations, and a questionnaire. $2.25.

The aim of the book is to equip the potential traveler with sufficient background information, as well as helpful travel suggestions, to make his foreign journey an even richer experience.

The Future of Arid Lands. The American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington 5, D.C. 1956. ix and 453 pages with illustrations, Summary Statement, Recommendations by the Socorro Conference, Committees for the Meetings, Participants in the Socorro Conference, and index. $6.75, $5.75 to AAAS Members.

This volume sets down the efforts of scientists from seventeen countries and from as many disciplines to assess the state of man's struggle to make productive and stable use of the world's arid lands.

Aviation Cartography. Card Division, Library of Congress, Washington 25, D.C. 1956. 114 pages with a bibliography and subject index. $0.85.

A bibliography and historical summary of aviation cartography.

Charles C. Colby. **Pilot Study of Southern Illinois.** Southern Illinois University Press, Carbondale, Illinois. 1956. xiii and 94 pages with illustrations, summary, and index. $7.50.

A study of southern Illinois whose problems, tho not unique, need to be understood in the context of the region's economic development. The author's analysis and appraisal provide such understanding, and his recommendations for courses of action provide insights into the complex problems of regions such as southern Illinois.

Charles Winick. **Dictionary of Anthropology.** Philosophical Library, Inc., 15 East 40th Street, New York 16, New York. 1956. vii and 579 pages. $10.00.

This is the only collection in any language of the specialized vocabularies of all the fields of anthropology. It includes approximately 10,000 entries from archaeology, cultural anthropology, linguistics, and physical anthropology.

A. K. Osborne. **An Encyclopedia of the Iron & Steel Industry.** Philosophical Library Inc., 15 East 40th Street, New York 16, New York. 1956. xi and 558 pages with illustrations, new processes and supplementary data, and appendices. $25.00.

The purpose of this Encyclopedia is to provide a concise description of the material, plant, tools and processes used in the Iron and Steel Industry, and in those industries closely allied to it, from the preparation of the ore, down to the finished product; and to define the technical terms employed. The book is intended as a work of reference, not in any sense as a textbook.

William D. Allen. **Life in Europe: Africa.** Virginia Creed. **Life in Europe: France.** Vincent and Ruth Malmström. **Life in Europe: Sweden.** The Fideler Company, Grand Rapids, Michigan. 1956. Africa—192 pages with illustrations and glossary, France—160 pages with illustrations and glossary, Sweden—160 pages with illustrations and glossary. $3.28 each for one to five copies, $2.46 each for five copies or more.

These geographies are published for use as supplementary textbooks. In each book the pictures, captions, and text are planned to help the student create in his mind many of the mental images that are necessary for understanding the geography and the people of the country.

GEOGRAPHICAL PUBLICATIONS RECEIVED

Walter A. Wittich and Gertie Hanson Halsted. **Educators Guide to Free Tapes, Scripts, and Transcriptions.** Educators Progress Service, Randolph, Wisconsin. 1957. xviii and 184 pages with a title index, subject index, and source and availability index. $5.75.

This book has the titles of tapes, scripts, and transcriptions—running time of each—dates of release—annotations—terms and conditions of loans—names and addresses of agencies—availability—sample scripts—suggestions on use of scripts—information on nature and content of tapes and transcriptions—new listings starred (*).

H. Peake and H. J. Fleure. **Times and Places.** Oxford University Press, 114 Fifth Avenue, New York 11, New York. 1956. xv and 336 pages with illustrations, a selection of studies for further reading, and index. $6.75.

The present volume is planned as a conclusion to the Series of Corridors of Time. The book falls into two parts. Part I includes the first three chapters and attempts a broad sketch of the work of recent years on man in the Old Stone Age. In Part II an attempt has been made to trace the spread of food production into a number of regions, and to follow life in those regions in a very broad outline from that beginning onwards.

W. Gordon East and A. E. Moodie. **The Changing World.** World Book Company, Yonkers-on-Hudson, New York, New York. 1956. xxvii and 1040 pages with illustrations and index. $7.75.

Co-operative effort of twenty experts drawn from five countries. Topical and interpretative.

Harold S. Gladwin. **A History of the Ancient Southwest.** The Bond Wheelwright Company, Freeport, Maine. 1957. xx and 383 pages with illustrations, bibliography, and index. $8.50.

A book for the archaeologist and for the layman. It traces the movements of its peoples from A.D. 400 to A. D. 1400.

A. C. O'Dell. **Railways and Geography.** Rinehart & Company, Inc., 232 Madison Avenue, New York 16, New York. 1956. 200 pages with illustrations, bibliography, glossary, and index. $1.50.

Examples are drawn from all the inhabited continents but special attention is paid to British and American conditions which illustrate the general principles, for Britain was the home of the first railways and North America saw the first applications on a continental scale.

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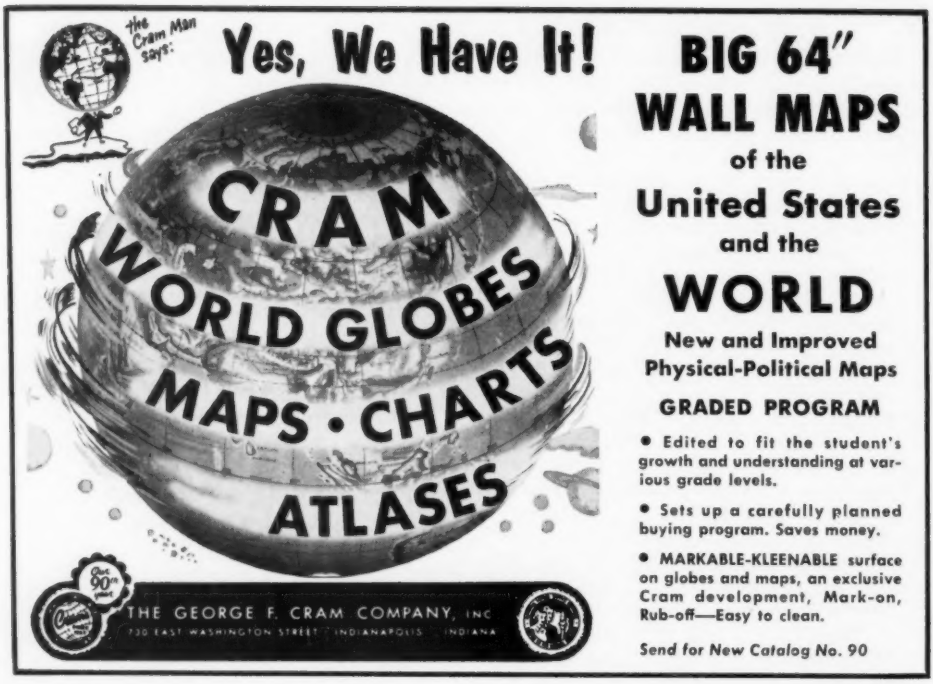
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Walter Isard. **Location and Space-Economy.** John Wiley & Sons, Inc., Starrett-Lehigh Building, 601 West 26th Street, New York 1, New York. 1956. xix and 350 pages with illustrations, author index, and subject index. $8.75.

The basic objective of this book is to improve the spatial and regional frameworks of the social science disciplines, particularly economics. To accomplish this objective, the author has attempted to develop a more adequate theory of location and space-economy.

Hans W. Weigert, Henry Brodie, Edward W. Doherty, John R. Fernstrom, Erick Fischer, and Dudley Kirk. **Principles of Political Geography.** Appleton-Century-Crofts, Inc., 35 West 32nd Street, New York 1, New York. 1957. xiv and 723 pages with maps, illustrations, and index. $7.95.

This book states the facts and poses the problems without, however, attempting to find easy answers for the latter. It aims, above all, at making the reader realize the importance and magnitude of the problems that arise from the interrelationship of political and geographical factors.

Norman J. G. Pounds and Edward L. Cooper. **World Geography.** Fifth Edition. South-Western Publishing Company, Chicago 5, Illinois. 1957. viii and 632 pages containing contents, illustrations, pronunciation of unusual and foreign proper names, and index.

A revision of a book published under the title of World Economic Geography by York, Rowe, and Cooper. The new title and descriptive subtitle indicate the new emphasis in the organization and content of the fifth edition.

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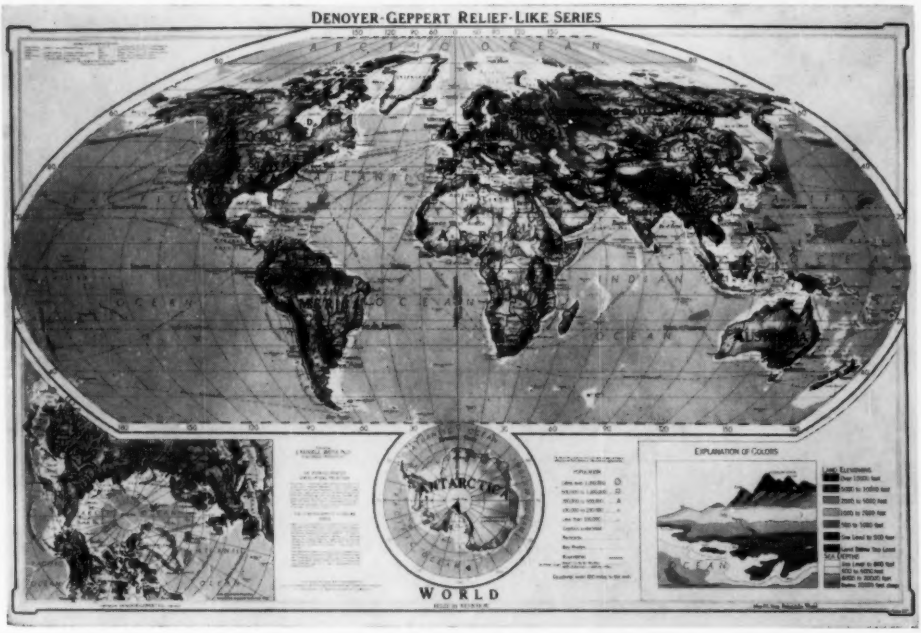

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